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| 09/745,996 | 12/26/2000 | Shoji Goto | 001717 | 1382 |

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WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP
1250 CONNECTICUT AVENUE, NW
SUITE 700
WASHINGTON, DC 20036

| EXAMINER |
|---|
| PERILLA, JASON M |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2638 | |

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| **Office Action Summary** | Application No.<br>09/745,996 | Applicant(s)<br>GOTO, SHOJI |
| | Examiner<br>Jason M. Perilla | Art Unit<br>2634 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>2</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on <u>02 February 2005</u>.

2a)☐ This action is **FINAL.**   2b)☐ This action is non-final.

3)☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-3,5-11 and 13-16* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☒ Claim(s) *1-3,5-11 and 13-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 December 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All  b)☐ Some * c)☐ None of:

        1.☒ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage

            application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

## DETAILED ACTION

1.      Claims 1-3, 5-11, and 13-16 are pending in the instant application.

### *Response to Amendment/Arguement*

2.      In view of the amendment to the claims filed February 2, 2005, the prior art

rejections set forth in the office action dated October 13, 2004 applied to claims 4 and

12 have been withdrawn.

### *Claim Objections*

3.      Claims 1-3, 5-11, and 13-16 are objected to because of the following

informalities:

Regarding claim 1, in line 20, "deciding whether" should be replaced by –

comparing--, and, in line 21, "exceeds" should be replaced by –with—for clarity of the

claim language.

Regarding claim 2, in line 17, "to cyclically input" should be replaced by –to

cyclically pass--, and, in line 20, "the received signal sequence" should be replaced by –

the received signal sequence input in time series manner--.

Regarding claim 3, to make the claim language more definite, it is suggested by

the Examiner that the claim is amended as follows:

> 3: The digital matched filter according to claim 2, wherein
> said logic circuits each have an input load capacitance smaller than an input load
> capacitance of each of said respectively corresponding predetermined number of storage
> circuits.

Regarding claim 5, to make the claim language more definite, it is suggested by

the Examiner that the claim is amended as follows:

> 5. A digital matched filter for despreading on reception side a received signal
> sequence having been spread on transmission side, comprising:

received signal holding means for successively holding samples constituting said received signal sequence input in time-series manner,

said received signal holding means including

a predetermined number of storage circuits for holding samples of said received signal sequence input in time-series manner in parallel in the same predetermined number as said predetermined number of storage circuits,

logic circuits provided at respective preceding stages of said predetermined number of storage circuits, said logic circuits each activated to pass an input signal to a corresponding one of said predetermined number of storage circuits and mask the input signal otherwise,

first control means for cyclically causing write enable state of said predetermined number of storage circuits at a predetermined timing to cyclically write said samples of the received signal sequence input in time-series manner into said predetermined number of storage circuits at said predetermined timing, and

second control means for cyclically activating said ~~predetermined number of~~ logic circuits at said predetermined timing to cyclically ~~input~~ <u>pass</u> said samples of the received signal sequence input in time-series manner to said predetermined number of storage circuits at said predetermined timing; and

said digital matched filter further comprising

spreading code generating means for generating a spreading code sequence for said despreading; and

correlation value calculating means for calculating a correlation value between said samples of the received signal sequence held in parallel in said predetermined number of storage circuits and said spreading code sequence,

said correlation value calculating means including

first product-sum calculating means for calculating a correlation value between a part of <u>the predetermined number of</u> samples held in said predetermined number of storage circuits and <u>a corresponding part of the generated spreading code sequence</u> ~~spreading codes corresponding to a corresponding part of samples in said generated spreading code sequence~~,

second product-sum calculating means for calculating a correlation value between <u>a remaining part of the predetermined number</u> ~~the rest~~ of samples held in said predetermined number of storage circuits and <u>a remaining part of the generated spreading code sequence</u> ~~spreading codes corresponding to a rest of samples in said generated spreading code sequence~~, and

decision means for ~~deciding whether~~ <u>comparing</u> the correlation value output from said first product-sum calculating means ~~exceeds~~ <u>with</u> a predetermined threshold value to stop calculation by said second product-sum calculating means when said decision means decides that the correlation value output from said first product-sum calculating means does not exceed said predetermined threshold value.

Regarding claim 6, the claim is objected to for the same reasons as applied to claim 3 above.

Regarding claim 7, to make the claim language more definite, it is suggested by the Examiner that the claim is amended as follows:

7. A digital matched filter for despreading on reception side a received signal sequence having been spread on transmission side, comprising:

received signal holding means for successively holding samples constituting said received signal sequence input in time-series manner,

said received signal holding means including

a first predetermined number of storage circuits for holding samples of said received signal sequence input in time-series manner in parallel in the same predetermined number as said first predetermined number of storage circuits, said first predetermined number of storage circuits being divided into a second predetermined number of groups,

logic circuits provided at respective preceding stages of said first predetermined number of storage circuits, said logic circuits each activated to pass an input signal to a corresponding one of said predetermined number of storage circuits and mask the input signal otherwise,

first control means for cyclically causing write enable state of said first predetermined number of storage circuits at a predetermined timing to cyclically write said samples of the received signal sequence input in time series manner into said first predetermined number of storage circuits at said predetermined timing, and

second control means for cyclically activating said logic circuits at said predetermined timing to cyclically ~~input~~ pass said samples of the received signal sequence input in time series manner to said first predetermined number of storage circuits at said predetermined timing;

said digital matched filter further comprising

spreading code generating means for generating a spreading code sequence for said despreading; and

correlation value calculating means provided respectively corresponding to said second predetermined number of groups each for calculating a correlation value between samples of said received signal sequence input in time-series manner held in ~~of~~ a corresponding one of said second predetermined number of group_s_ and a part of said spreading code sequence,

each of said correlation value calculating means including

first product-sum calculating means for calculating a correlation value between a ~~part of~~ samples held in the storage circuits of ~~the corresponding~~ a first one of said second predetermined number of groups and a corresponding first part of said spreading codes sequence ~~corresponding to a corresponding part of samples in said generated spreading code sequence~~,

second product-sum calculating means for calculating a correlation value between ~~the rest of~~ samples held in ~~said~~ the storage circuits of ~~the corresponding~~ a second one of said second predetermined number of groups and a corresponding second part of said spreading codes sequence ~~corresponding to a rest of samples in said generated spreading code sequence~~, and

decision means for ~~deciding whether~~ comparing the correlation value output from each of said first product-sum calculating means ~~exceeds~~ with a predetermined threshold value to stop calculation by each corresponding said second product-sum calculating means when said decision means decides that the correlation value output from said first product-sum calculating means does not exceed said predetermined threshold value; and

said digital matched filter further comprising

output control means for successively outputting in time-series manner respective correlation values output from respective ones of said correlation value calculating means as correlation values output from one system.

Regarding claim 8, the claim is objected to for the same reasons as applied to

claim 3 above.

Regarding claim 9, to make the claim language more definite, it is suggested by

the Examiner that the claim is amended as follows:

> 9. A mobile wireless terminal for digital radio communication comprising
> reception-related modem means for demodulating received digital data and
> signal processing means for processing a signal received by said reception-related
> modem means to output the processed signal,
> said reception-related modem means including a digital matched filter for despreading on
> reception side a received signal sequence having been spread on transmission side,
> said digital matched filter comprising:
> received signal holding means for successively holding a predetermined number of
> samples among samples constituting said received signal sequence input in time-series manner;
> spreading code generating means for generating a spreading code sequence for said
> despreading; and
> correlation value calculating means for calculating a correlation value between
> said predetermined number of samples held in said received signal holding means and
> said generated spreading code sequence,
> said correlation value calculating means including
> first product-sum calculating means for calculating a correlation value between a
> part of the predetermined number of samples held in said received signal holding means
> and a corresponding part of the generated spreading codes sequence ~~corresponding to~~
> ~~said part of the predetermined number of samples in said generated spreading code~~
> ~~sequence~~,
> second product-sum calculating means for calculating a correlation value between
> a remaining part of the predetermined number of samples ~~of the predetermined number of~~
> ~~samples~~ held in said received signal holding means and a corresponding remaining part of the
> generated spreading codes ~~corresponding to said remaining number of samples in said~~
> ~~generated spreading code sequence~~, and
> decision means for ~~deciding whether~~ comparing the correlation value output from
> said first product-sum calculating means ~~exceeds~~ with a predetermined threshold value
> to stop calculation by said second product-sum calculating means when said decision
> means decides that the correlation value output from said first product-sum calculating
> means does not exceed said predetermined threshold value.

Regarding claim 10, the claim is objected to for the same reasons as applied to

claim 2 above.

Regarding claim 11, the claim is objected to for the same reasons as applied to

claim 3 above.

Regarding claim 13, to make the claim language more definite, it is suggested by

the Examiner that the claim is amended as follows:

> 13. A mobile wireless terminal for digital radio communication comprising
> reception-related modem means for demodulating received digital data and

signal processing means for processing a signal received by said reception-related modem means to output the processed signal,

said reception-related modem means including a digital matched filter for despreading on reception side a received signal sequence having been spread on transmission side,

said digital matched filter comprising:

received signal holding means for successively holding samples constituting said received signal sequence input in time-series manner,

said received signal holding means including

a predetermined number of storage circuits for holding samples of said received signal sequence input in time-series manner in parallel in the same predetermined number as said predetermined number of storage circuits,

logic circuits provided at respective preceding stages of said predetermined number of storage circuits, said logic circuits each activated to pass an input signal to a corresponding one of said predetermined number of storage circuits and mask the input signal otherwise,

first control means for cyclically causing write enable state of said predetermined number of storage circuits at a predetermined timing to cyclically write said samples of the received signal sequence input in time-series manner into said predetermined number of storage circuits at said predetermined timing, and

second control means for cyclically activating said logic circuits at said predetermined timing to cyclically ~~input~~ pass said samples of the received signal sequence input in time-series manner to said predetermined number of storage circuits at said predetermined timing; and

said digital matched filter further comprising

spreading code generating means for generating a spreading code sequence for said despreading; and

correlation value calculating means for calculating a correlation value between said samples of the received signal sequence held in parallel in said predetermined number of storage circuits and said spreading code sequence,

said correlation value calculating means including

first product-sum calculating means for calculating a correlation value between a part of the predetermined number of samples held in said predetermined number of storage circuits and a corresponding part of the generated spreading code sequence ~~spreading codes corresponding to a corresponding part of samples in said generated spreading code sequence~~,

second product-sum calculating means for calculating a correlation value between a remaining part of the predetermined number ~~the rest~~ of samples held in said predetermined number of storage circuits and a remaining part of the generated spreading code sequence ~~spreading codes corresponding to a rest of samples in said generated spreading code sequence~~, and

decision means for ~~deciding whether~~ comparing the correlation value output from said first product-sum calculating means ~~exceeds~~ with a predetermined threshold value to stop calculation by said second product-sum calculating means when said decision means decides that the correlation value output from said first product-sum calculating means does not exceed said predetermined threshold value.

Regarding claim 14, the claim is objected to for the same reasons as applied to claim 3 above.

Regarding claim 15, to make the claim language more definite, it is suggested by

the Examiner that the claim is amended as follows:

> 15. A mobile wireless terminal for digital radio communication comprising
> reception-related modem means for demodulating received digital data and
> signal processing means for processing a signal received by said reception-
> related modem means to output the processed signal,
> said reception-related modem means including a digital matched filter for
> despreading on reception side a received signal sequence having been spread on
> transmission side,
> said digital matched filter comprising:
> received signal holding means for successively holding samples constituting said
> received signal sequence input in time-series manner,
> said received signal holding means including
> a first predetermined number of storage circuits for holding samples of said
> received signal sequence input in time-series manner in parallel in the same
> predetermined number as said predetermined number of storage circuits, said first
> predetermined number of storage circuits being divided into a second predetermined
> number of groups,
> logic circuits provided at respective preceding stages of said first predetermined
> number of storage circuits, said logic circuits each activated to pass an input signal to a
> corresponding one of said predetermined number of storage circuits and mask the input
> signal otherwise,
> first control means for cyclically causing write enable state of said first
> predetermined number of storage circuits at a predetermined timing to cyclically write
> said samples of the received signal sequence input in time-series manner into said first
> predetermined number of storage circuits at said predetermined timing, and
> second control means for cyclically activating said logic circuits at said
> predetermined timing to cyclically ~~input~~ pass said samples of the received signal
> sequence input in time-series manner to said first predetermined number of storage
> circuits at said predetermined timing;
> said digital matched filter further comprising
> spreading code generating means for generating a spreading code sequence for
> said despreading; and
> correlation value calculating means provided respectively corresponding to said
> second predetermined number of groups each for calculating a correlation value between
> samples of said received signal sequence of a corresponding one of said second
> predetermined number of groups and a part of said spreading code sequence,
> each of said correlation value calculating means including
> first product-sum calculating means for calculating a correlation value between a
> ~~part of~~ samples held in the storage circuits of ~~the corresponding~~ a first one of said second
> predetermined number of groups and a corresponding first part of said spreading codes
> sequence ~~corresponding to a corresponding part of samples in said generated spreading~~
> ~~code sequence,~~
> second product-sum calculating means for calculating a correlation value
> between ~~the rest of~~ samples held in ~~said~~ the storage circuits of ~~the corresponding~~ a second
> one of said second predetermined number of groups and a corresponding second part of said
> spreading codes sequence ~~corresponding to a rest of samples in said generated spreading~~
> ~~code sequence,~~ and
> decision means for ~~deciding whether~~ comparing the correlation value output from
> said first product-sum calculating means ~~exceeds~~ with a predetermined threshold value

to stop calculation by said second product-sum calculating means when said decision
means decides that the correlation value output from said first product-sum calculating
means does not exceed said predetermined threshold value; and

said digital matched filter further comprising

output control means for successively outputting in time-series manner
respective correlation values output from respective ones of said correlation value
calculating means as correlation values output from one system.

Regarding claim 16, the claim is objected to for the same reasons as applied to

claim 3 above.

Appropriate correction is required.

### *Allowable Subject Matter*

4.      Claims 1-3, 5-11, and 13-16 are indicated to contain allowable subject matter for

the reasons stated in the office action dated October 13, 2004.

### *Conclusion*

5.      This application is in condition for allowance except for the following formal

matters:

The objections above.

Prosecution on the merits is closed in accordance with the practice under *Ex*

*parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO**

**MONTHS** from the mailing date of this letter.

6.      Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-

3055. *The Applicant is invited to contact the Examiner in regards to any questions or*

*concerns regarding the proposed changes above to expedite the prosecution of the*

*case.* The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number

for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Jason M. Perilla
June 10, 2005

jmp

CHIEH M. FAN
PRIMARY EXAMINER